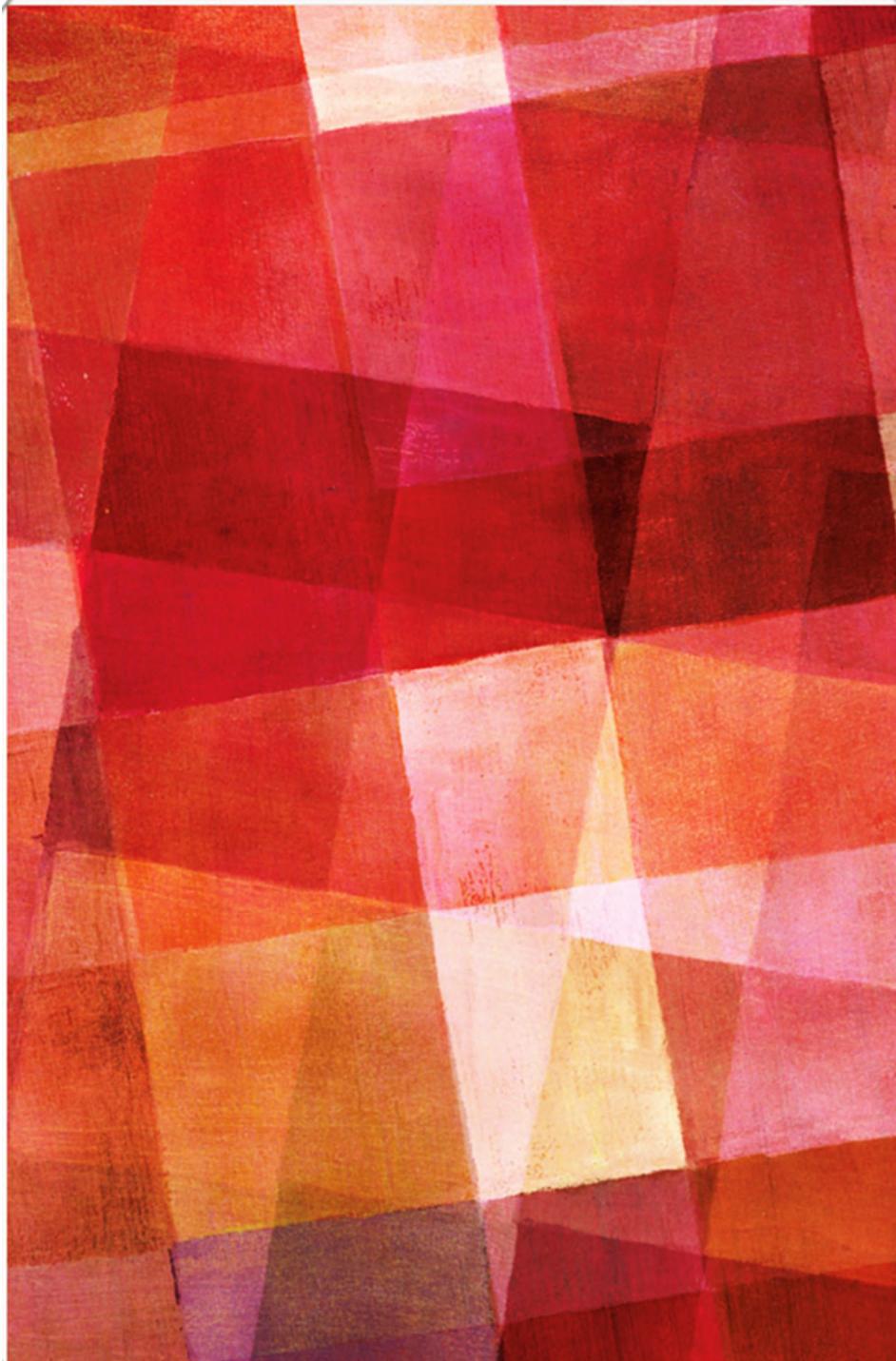


# EXHIBIT 9

# ASSESSING NUMERACY IN A FACULTY DEVELOPMENT PROGRAM

---

*Sarah L. Hoiland, Ph.D.  
Assistant Professor of Sociology  
City University of New York  
Hostos Community College*



## NUMERACY INFUSION FOR COLLEGE EDUCATORS (NICE)

---

- What is NICE?
- A collaborative two-year National Science Foundation (NSF) Improving Undergraduate STEM Education (IUSE) Project
- Research Questions:
  - How does the NICE program enhance the QR teaching abilities of faculty?
  - How does the NICE program impact faculty efforts to infuse QR into their course instruction?
  - How does faculty participation in NICE translate into real QR learning gains among CUNY students?

# SUMMER 2017 COHORT



CONFIDENTIAL

P000238

## ACADEMIC YEAR 2017-2018 COHORT



CONFIDENTIAL

P000239

## TWO DAY WORKSHOPS

---

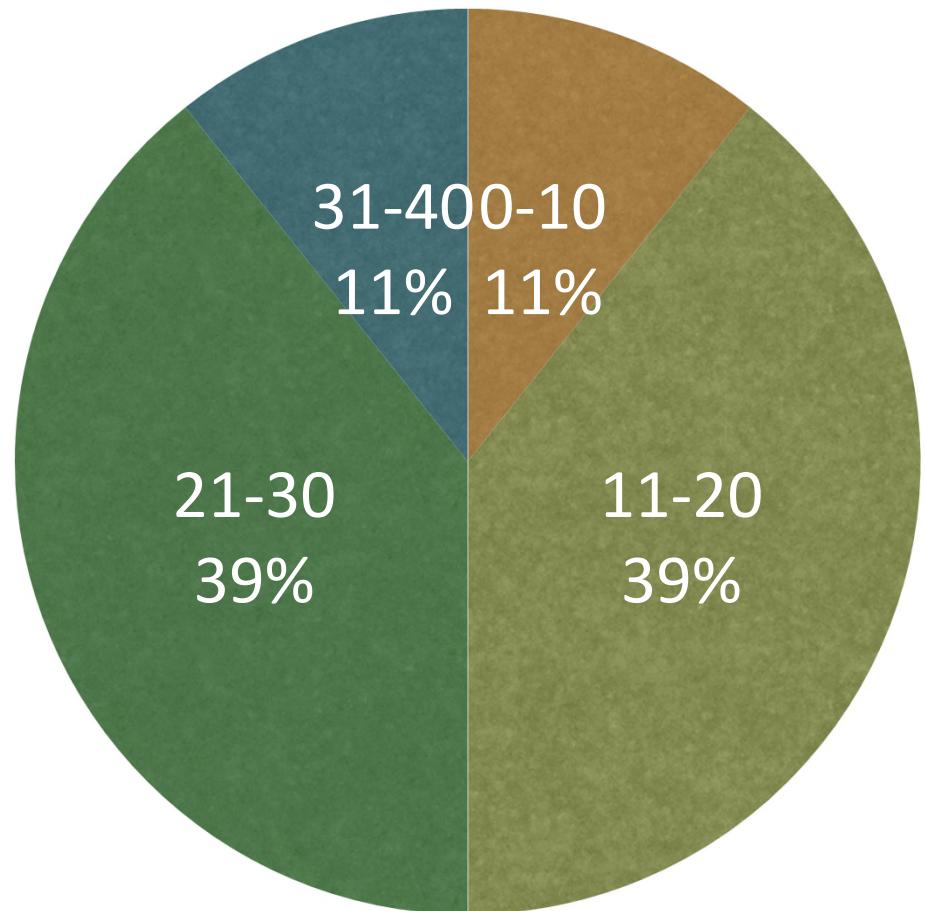
- Overarching Goals:
  - Create a learning community
    - Summer cohort (June 2017-August 2017)
    - Academic year cohort (August 2017-April 2018)
  - Introduce faculty to quantitative reasoning/ quantitative literacy
  - Assess faculty and train faculty how to assess using the Critical Thinking Assessment Test (CAT)
  - Introduce faculty to NICE Program requirements
  - Discuss *Math for Life* by Jeffrey Bennett

# REFLECTIONS ON THE CAT

---

- How do we assess critical thinking?
- What is it like to be a student?
- Bronx CUNY CAT Scores
  - n = 29
  - mean: 20.95
  - range: 7-32
- CAT National Means
  - community college—13.48
  - four-year freshman—13.66
  - four-year senior—19.04

Faculty CAT Scores



# QR/QL PROFESSIONAL DEVELOPMENT

---

## 8 Blackboard QR/QL Modules:

1. Quantitative Reasoning (QR) and Making Numbers Meaningful
2. QR Learning Objectives
3. The Brain, Cognition and QR
4. QR and Writing
5. Discovery Methods
6. Representations of Data
7. QR Assessment
8. Math Anxiety and QR Stereotypes and Culture

Readings, videos, BB Discussion Forums, Voice Threads, BB Assignments, and NICE Tasks (QR Learning Goals, QR Assignment, QR Assessment)

Feedback on NICE Tasks

Peer

NICE Team

\* revise and resubmit

# HOW TO DEVELOP A QR ASSESSMENT INSTRUMENT

---

- (1) Articulate your QR learning goal(s)
- (2) Design effective teaching tools to meet those QR learning goals
- (3) Adapt and/or develop an **assessment instrument (or instruments)**
- (4) Develop an **assessment plan** that will effectively utilize the assessment instrument(s)
- (5) Analyze the assessment data, consider how to "close the loop," and use the assessment results to improve instruction

See: [NICE/NICHE Teach QR](#)

# QR ASSESSMENT—KEY DELIVERABLE

---

## **QR Assessment Instrument**

Please restate your revised QR learning goals that you developed in this blog along with your QR assessment instrument. We ask that your QR assessment be simple and consist of 3 questions (e.g., multiple choice questions or problems with accompanying scoring rubrics similar to the CAT) that directly correspond to the 3 learning goals you have articulated (if you are undertaking a pre-test/post-test design, you may want to develop two versions of the instrument, although we recognize that given where we are in the semester you may be unable to administer a pretest assessment at this point in time).

**PLEASE KEEP YOUR ASSESSMENT INSTRUMENT SIMPLE and include only 3 questions/problems with scoring rubrics, etc.!**

Your assessment instrument should be designed to measure whether or not (or the extent to which) your QR lesson/assignment succeeded in teaching students the 3 learning goals you put forward. The assessment should be designed to give feedback to you as an instructor! Please indicate when and how you plan to administer your assessment instrument in your blog post!

# QR ASSESSMENT—KEY DELIVERABLE

---

## QR Assessment Instrument

Please note that there are examples of course-specific assessment instruments on our [instructional materials from NICHE/NICE webpage](#).

Assessments can take a huge variety of forms and we encourage you to assess in a way that makes sense for your course and for your learning objectives. However, we also strongly encourage you to assess narrowly, specifically focusing on your QR learning goals, rather than the course as a whole or the college experience as a whole.

Since you have articulated 3 learning goals [in each of three areas, e.g., (a) knowledge and conceptual understanding; (b) thinking and other skills; and (c) attitudes, values, dispositions and habits of mind], we ask you to develop a simple 3-question assessment instrument that corresponds to those 3 learning goals.

**Keep it simple: pre/post, three questions,  
and a scoring rubric**

# QR ASSESSMENT FEEDBACK GUIDELINES

---

## **Guidelines for Developing and Providing Feedback on QR Assessment Instrument**

- (1) Does the assessment instrument (or instruments if there are two versions) include 3 questions (or scoring rubrics, etc.) that are clear and straightforward?
- (2) Can (and how will) the results of the assessment plan and instrument be used to evaluate whether the instructor effectively taught specific QR skills and/or achieved his or her QR learning goals? How do the skills assessed in the instrument correspond to the QR learning goals articulated by the instructor as well as those taught in the QR lesson plan in terms of (a) knowledge and conceptual understanding; (b) thinking and other skills; and (c) attitudes, values, dispositions and habits of mind?

# QR ASSESSMENT FEEDBACK GUIDELINES

---

## Guidelines for Developing and Providing Feedback on QR Assessment Instrument

(3) What are the strengths and weaknesses of the QR assessment plan and instrument? Please indicate at least one way in which the assessment instrument could be improved. In responding to this question, please consider the following:

- (a) Can the assessment be used to evaluate the effectiveness of the QR lesson plan (including assignments, readings, etc.)? For example, does the instructor plan to use a pre-test/post-test design, is there a comparison group, etc.
- (b) Does the QR assessment instrument extend beyond just being a math skills test and emphasize *the ability to reason with quantitative information*?
- (c) Is the assessment instrument valid (i.e., does it get at what the instructor is trying to measure)?
- (d) Is the instrument sound? For example, if the instrument relies on multiple choice questions, are the response options mutually exclusive and is the correct answer clearly identifiable? If the assessment instrument (or a specific question) relies on a rubric, do the scoring criteria make sense and will the exercise authoritatively assess a QR skill (or skills)?

# QR ASSESSMENT FEEDBACK GUIDELINES

---

## **Guidelines for Developing and Providing Feedback on QR Assessment Instrument**

(4) Is the assessment instrument **independent** of the course QR lesson(s)/assignment(s)? In other words, can it be used to evaluate the effectiveness of the QR lesson(s)/assignment(s)?

**Clarity, alignment, generalizability,  
validity, and soundness**

# SAMPLE NICE ASSESSMENT

---

## CRJ 23 QR Assessment

**This assessment is administered on [www.surveymonkey.com](http://www.surveymonkey.com)**

*Select the response you think best describes the term and/or your perceptions of quantitative reasoning.*

- *True/False* \_\_\_\_\_ Quantitative reasoning is the application of basic mathematics skills to analyze and interpret real-world **qualitative** information in the context of a discipline or an interdisciplinary problem to draw conclusions that are relevant to students in their daily lives.
- *True/False* \_\_\_\_\_ Quantitative reasoning is the application of basic mathematics skills to analyze and interpret real-world **quantitative** information in the context of a discipline or an interdisciplinary problem to draw conclusions that are relevant to students in their daily lives.
- How important do you think **quantitative reasoning** is in the field of criminal justice?
  - very important
  - somewhat important
  - indecisive
  - somewhat not important
  - not important

## SAMPLE NICE ASSESSMENT

---

o According to the pie chart above (Prison Policy Initiative), what *percentage* of the state prison population is comprised of drug convictions? Include your calculation.

- 12%
- 10%
- 20%
- 16%

o According to the pie chart above (Prison Policy Initiative), what *percentage* of the federal population is comprised of drug convictions? Include your calculation.

- 44%
- 22%
- 33%
- 11%

o 2.3 million incarcerated adults in the U.S. is compared to (*select your response*):

- All military personnel
- Yankee Stadium old out 56 games
- Boston, Baltimore, and San Francisco combined
- All of the above
- None of the above

# SAMPLE NICE ASSESSMENT

---

*Select the response you think best describes the term and/or your perceptions of quantitative reasoning.*

○ How comfortable have you felt communicating with numbers **prior to completing this Introduction to Corrections (CRJ 23)** class, *please select a response:*

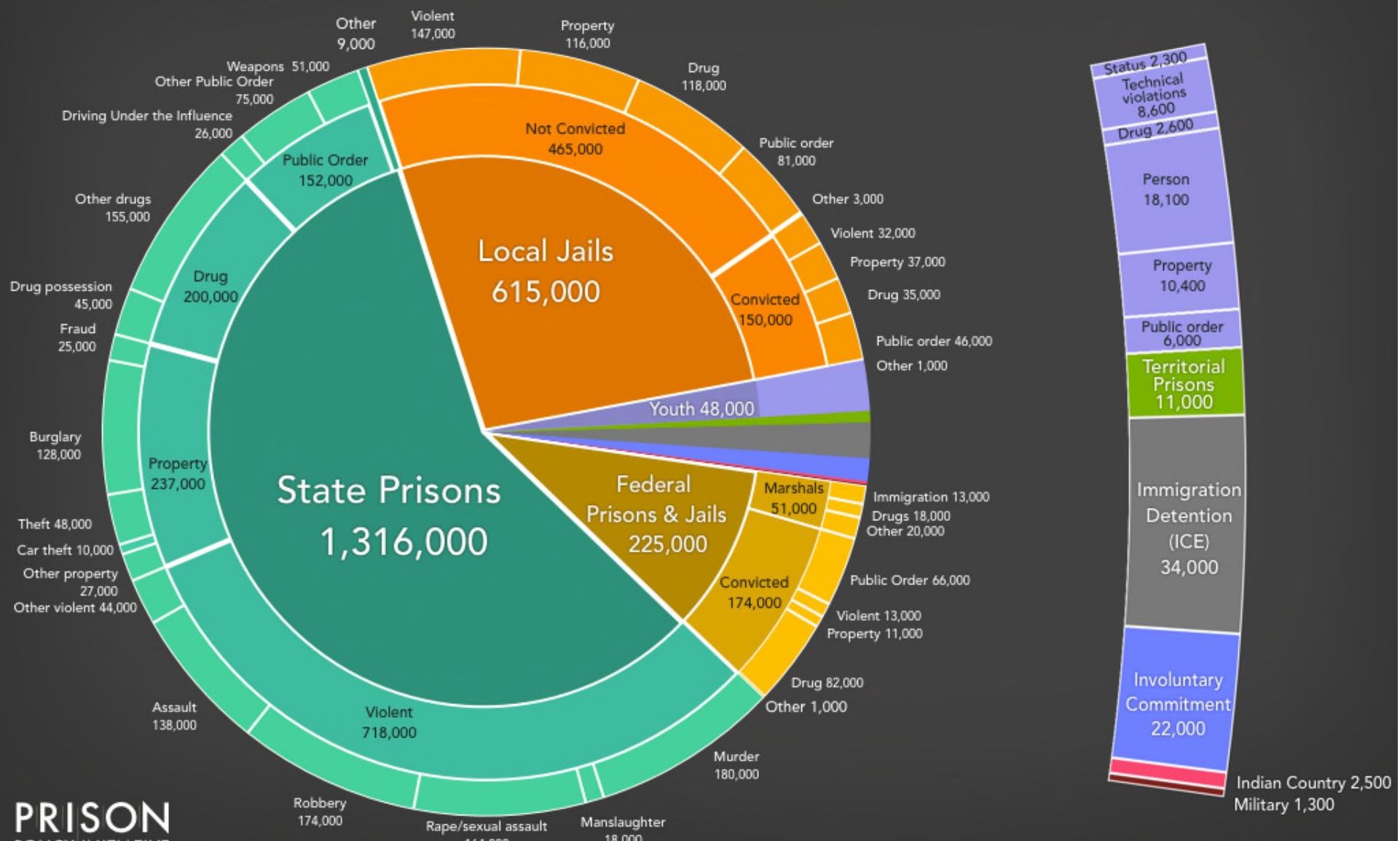
- Extremely Uncomfortable
- Somewhat Uncomfortable
- Comfortable
- Somewhat Comfortable
- Extremely Comfortable

○ How comfortable do you feel communicating with numbers in criminal justice **since completing this Introduction to Corrections (CRJ 23)**, *please select a response:*

- Extremely Uncomfortable
- Somewhat Uncomfortable
- Comfortable
- Somewhat Comfortable
- Extremely Comfortable

## How many people are locked up in the United States?

The United States locks up more people, per capita, than any other nation. But grappling with why requires us to first consider the many types of correctional facilities and the reasons that 2.3 million people are confined there.



PRISON  
POLICY INITIATIVE

Sources and data notes: See <https://www.prisonpolicy.org/reports/pie2018.html>

CONFIDENTIAL

P000252

# SAMPLE NICE ASSESSMENT RESULTS

---

1. short answers (no rubric—difficult to assess)
2. How important do you think quantitative reasoning is in the field of criminal justice?  
92% Very Important or very important
3. According to the pie chart, what percentage of the state prison population is comprised of drug convictions?  
92%—Correct answer
4. According to the pie chart, what percentage of the federal population is comprised of drug convictions?  
83.333%- Correct answer
5. short answers (no rubric—difficult to assess)
6. How comfortable did you feel communicating with numbers in criminal justice prior to completing this Introduction to Corrections (CRJ 23) class, please select a response:  
49% extremely or somewhat comfortable  
25% neither comfortable nor uncomfortable  
16% uncomfortable extremely uncomfortable

## SAMPLE NICE ASSESSMENT RESULTS

---

7. How comfortable do you feel communicating with numbers in criminal justice since completing this Introduction to Corrections (CRJ 23), please select a response:

66.66% extremely or somewhat comfortable  
8.33% neither comfortable nor uncomfortable  
**17% uncomfortable or extremely uncomfortable**

8. My comfort communicating with numbers/quantitative reasoning improved since completing this Introduction to Corrections course.

True 83.333%  
False 8.333%

9. My ability to communicate with numbers/quantitative reasoning improved since completing this Introduction to Corrections course.

True 83.333%  
False 8.333%

# NICE ASSESSMENT EVOLUTION

---

- SOC 101 [Assessment](#)
- SOC 101 [Results](#)
- Fall 2017, Summer 2018 and Fall 2019
  - Two sociologists did their own thing...
    - disappointed w/ assessment results (some “got it” but many were totally left behind)
    - concerns about the amount of time was required
    - students needed MORE (instruction, application opportunities, and confidence)
  - Two sociologists walked into a classroom (Fall 2019)
    - not just “you”
    - highlighted different teaching styles/ same concepts
    - partner work
    - faculty available for immediate help
    - scaffold QR/QL (QR Assignment was 1/8 of the length of Fall '17 and Summer '18!)

# POST-QR SOC 101 STUDENT REFLECTIONS

---

Did you find this assignment to valuable? Why or why not?

“I did find this assignment to be valuable because it showed me that I have quite a lot of studying to do in order to fully understand what it means to think like a sociologist. There were also some insights into just how much of the Bronx is so impoverished, which to me previously was just something I see and hear all the time.”

“I did find this assignment to be very valuable. If open my eyes to the amount of concentrated poverty right where I live that I was not aware of. Mostly of the amount in children living in poverty. At an unconscious level I was aware of the inequality between jobs, and race, And between jobs and female wages. But it is amazing to see it represented in number!”

“Frankly speaking this assignment is very good regardless of the difficulties of finding some data, it has enlightened my knowledge on what is going on my neighborhood and what I can do individually to help others.”



CONFIDENTIAL

P000257



## 2018 NICE Capstone Conference Hostos Community College

CONFIDENTIAL

P000258